

**WHAT IS CLAIMED IS:**

1. A liquid crystal display device, comprising:

a liquid crystal cell, the liquid crystal cell including  
a pair of substrates and a liquid crystal layer provided between  
the pair of substrates;

a pair of polarizers provided so as to oppose each other  
via the liquid crystal cell therebetween;

a phase compensation element provided between the liquid  
crystal cell and at least one of the pair of polarizers; and

an antiglare layer provided on a viewer side of one of  
the pair of polarizers which is provided closer to a viewer,

wherein the antiglare layer is designed so that a specular  
reflection characteristic thereof for light incident thereupon  
from the viewer side and a specular transmission characteristic  
thereof for light transmitted therethrough from the liquid crystal  
layer to the viewer side satisfy a predetermined relationship,  
thereby suppressing a reduction in color reproducibility as viewed  
from a direction inclined from a normal to a display plane.

2. The liquid crystal display device of claim 1, wherein  
the phase compensation element has an index ellipsoid which has  
three principal axes, a-axis, b-axis and c-axis, which are  
orthogonal to one another and three principal refractive indices,  
 $n_a$ ,  $n_b$  and  $n_c$ , and wherein  $n_a = n_c > n_b$ , a-axis is substantially  
parallel to a layer plane of the liquid crystal layer, and b-axis  
is inclined with respect to a layer normal of the liquid crystal  
layer.

3. The liquid crystal display device of claim 1, wherein the antiglare layer has an internal scattering layer and a scattering surface.

4. The liquid crystal display device of claim 3, wherein the internal scattering layer includes a polymer matrix and particles dispersed in the polymer matrix, the particles have a scattering center, and a refractive index of the particles and a refractive index of the polymer matrix are different from each other.

5. The liquid crystal display device of claim 1, wherein a haze value of the antiglare layer is equal to or greater than 15.

6. The liquid crystal display device of claim 1, wherein a haze value of the antiglare layer is equal to or greater than 40.

7. The liquid crystal display device of claim 1, wherein the antiglare layer is such that a value of transmitted image clarity is equal to or greater than 10 as measured with an image clarity meter in which a width of an optical comb is 0.5 mm.

8. The liquid crystal display device of claim 1, wherein a refractive index anisotropy  $\Delta n(550)$  of a liquid crystal material of the liquid crystal layer for light having a wavelength of 550 nm is in a range of  $0.060 < \Delta n(550) < 0.120$ .

9. The liquid crystal display device of claim 1, wherein the phase compensation element is arranged so that b-axis forms an angle in a range of  $15^\circ$  to  $75^\circ$  with respect to a layer normal

of the liquid crystal layer.

10. The liquid crystal display device of claim 1, wherein  
( $n_a - n_b$ ) $\times d$  is in a range of 80 nm to 250 nm, where d denotes a  
thickness of the phase compensation element in a layer normal  
5 direction of the liquid crystal layer.

11. A liquid crystal display device, comprising:

a liquid crystal cell, the liquid crystal cell including  
a pair of substrates and a liquid crystal layer provided between  
the pair of substrates;

10 a pair of polarizers provided so as to oppose each other  
via the liquid crystal cell therebetween;

a phase compensation element provided between the liquid  
crystal cell and at least one of the pair of polarizers; and

15 an antiglare layer provided on a viewer side of one of  
the pair of polarizers which is provided closer to a viewer, wherein:

the antiglare layer is designed so that a specular  
reflection characteristic thereof for light incident thereupon  
from the viewer side and a specular transmission characteristic  
thereof for light transmitted therethrough from the liquid crystal  
20 layer to the viewer side satisfy a predetermined relationship,  
thereby suppressing a reduction in color reproducibility as viewed  
from a direction inclined from a normal to a display plane; and

the antiglare layer has an internal scattering layer and  
a scattering surface.

25 12. The liquid crystal display device of claim 11, wherein  
the phase compensation element has an index ellipsoid which has

three principal axes, a-axis, b-axis and c-axis, which are orthogonal to one another and three principal refractive indices,  $n_a$ ,  $n_b$  and  $n_c$ , and wherein  $n_a = n_c > n_b$ , a-axis is substantially parallel to a layer plane of the liquid crystal layer, and b-axis is inclined with respect to a layer normal of the liquid crystal layer.

13. The liquid crystal display device of claim 11, wherein the internal scattering layer includes a polymer matrix and particles dispersed in the polymer matrix, the particles have a scattering center, and a refractive index of the particles and a refractive index of the polymer matrix are different from each other.

14. The liquid crystal display device of claim 11, wherein a haze value of the antiglare layer is equal to or greater than 15.

15. The liquid crystal display device of claim 11, wherein a haze value of the antiglare layer is equal to or greater than 40.

16. The liquid crystal display device of claim 11, wherein the antiglare layer is such that a value of transmitted image clarity is equal to or greater than 10 as measured with an image clarity meter in which a width of an optical comb is 0.5 mm.

17. The liquid crystal display device of claim 11, wherein a refractive index anisotropy  $\Delta n(550)$  of a liquid crystal material of the liquid crystal layer for light having a wavelength of 550 nm is in a range of  $0.060 < \Delta n(550) < 0.120$ .

18. The liquid crystal display device of claim 11, wherein the phase compensation element is arranged so that b-axis forms an angle in a range of  $15^{\circ}$  to  $75^{\circ}$  with respect to a layer normal of the liquid crystal layer.

5            19. The liquid crystal display device of claim 11, wherein  $(n_a - n_b) \times d$  is in a range of 80 nm to 250 nm, where d denotes a thickness of the phase compensation element in a layer normal direction of the liquid crystal layer.

Patent Application No. 2011-000000